(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
15 September 2005 (15.09.2005)

PCT

(10) International Publication Number
WO 2005/085481 A1

(51) International Patent Classification[7]: C21D 8/00, B21B 1/08

(21) International Application Number: PCT/JP2005/004582

(22) International Filing Date: 9 March 2005 (09.03.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2004-065676 9 March 2004 (09.03.2004) JP
2004-285934 30 September 2004 (30.09.2004) JP

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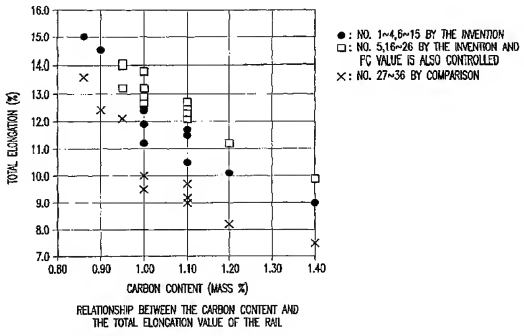
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH,

[Continued on next page]

(54) Title: A METHOD FOR PRODUCING HIGH-CARBON STEEL RAILS EXCELLENT IN WEAR RESISTANCE AND DUCTILITY



RELATIONSHIP BETWEEN THE CARBON CONTENT AND THE TOTAL ELONGATION VALUE OF THE RAIL

(57) Abstract: Disclosed are methods of producing steel rails having a high carbon content and being excellent in wear resistance and ductility from the slabs for rails. One method involves producing a steel rail having a high content of carbon, comprising finish rolling the rail in two consecutive passes, with a reduction rate per pass of a cross-section of the rail of 2-30%, wherein the conditions of the finish rolling satisfy the following relationship: $S \leq 800 / (C \times T)$, wherein S is the maximum rolling interval time (seconds), C is the carbon content of the steel, wherein the carbon content is 0.85-1.40 mass%, and T is the maximum surface temperature (°C) of the rail head. Another method involves producing a steel rail with a high content of carbon, comprising: finish rolling the rail in three or more passes, with a reduction rate per pass of a cross-section of the rail of 2-30%, wherein the conditions of the finish rolling satisfy the following relationship: $S \leq 2400 / (C \times T \times P)$, wherein S is the maximum rolling interval time (seconds), C is the carbon content of the steel rail, wherein the carbon content is 0.85~1.40 mass%, T is the maximum surface temperature (°C) of a rail head, and P is the number of passes, which is 3 or more. In addition to above, controlled additional amounts of V, Nb, N may be added to the steel rail and/or controlled rapid cooling of the rail after rolling may be accomplished to provide further improvements.

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GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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